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## COLOR NOMENCLATURE FOR NATURALISTS

**A. Code of Colors for Naturalists.**<sup>1</sup>—In 1905 Dr. R. M. Strong called attention in *Science* (Vol. XXI, pp. 267–268) to the availability for naturalists' use of the Bradley Educational Colored Papers. Little books containing about 165 samples of these papers may be had for five cents from dealers in kindergarten supplies. Since Ridgway's "A Nomenclature of Colors for Naturalists" went out of print, there has been no convenient and rapid means of designating colors with precision other than by the use of the Bradley papers.

The present work attempts to furnish to all who have to designate colors with precision a simple, practical and unmistakable means of indicating them. This is accomplished by supplying, at a low price, a book of convenient size for the pocket in which are contained a sufficient number of samples of different colors arranged in accordance with a recognized scientific plan and prepared with materials as durable as our knowledge of chemistry permits. All names of colors are rejected except those of the six spectral colors, red, orange, yellow, green, blue and violet. Thus is avoided the confusion inseparable from the use of names for colors. The scheme includes 24 "pure" colors, the six colors of the spectrum named above; six other colors obtained by combining the adjacent spectral colors to produce intermediate colors called red-orange, orange-yellow, yellow-green, green-blue, blue-violet and violet-red; and twelve other colors intermediate between the twelve above named. Thus between red and red-orange there intervenes a lighter red, between red-orange and orange a lighter red-orange, so that the order of the twenty-four colors is as follows: red, red, red-orange, red-orange, orange, orange, orange-yellow, orange-yellow, yellow, yellow, etc. Each color is intermediate between that which precedes and that which follows it. Each of the twenty-four pure colors is made the basis of a double page of samples, on which it appears along with twenty-nine tints, shades and broken colors produced by mixing the pure color with white, black or gray. Twenty-four of these tints and shades and broken colors, in which the white and black are

<sup>1</sup>Klincksieck, Paul, et Valette, Th. *Code des Couleurs à l'usage des Naturalistes, Artistes, Commerçants et Industriels*, 720 Échantillons de Couleurs classés d'après la méthode Chevreul simplifiée. Paris, 1908; 1 vol., 86 pp., 4¾ x 7½ in. 48 pages contain 720 samples of colors.

used in definite proportions, are numbered consecutively with the pure color from which they are derived, so that the first double page of samples contains reds numbered from 1 to 25, the second reds numbered from 26 to 50, the third red-oranges from 51 to 75, the fourth red-oranges from 76 to 100. Thus the first 100 numbers are given up to red (including red-orange), the numbers from 101 to 200 indicate oranges (including orange-yellow), and so on through the spectrum, until the numbers 501 to 600 indicate violet (including violet-red). In addition to the six hundred colors thus numbered consecutively, there are 120 others, five on each page, all made by adding white to the pure color or to one of the broken colors and all designated by prefixing letters to the numbers on the same page. Thus the number of colors is brought up to 720.

To designate a color it is only necessary to refer to it by its code number. Thus a naturalist may describe the color of a bird as C. C. 120 (C. C. as an abbreviation for *Code des Couleurs*), and one reading his description knows at once, since the number falls in the second hundred, that the color is a broken orange and by turning to his code has the color itself before him. The naturalist may carry the book into the field and on a pencil sketch may enter the numbers of the colors of natural objects, and from such notes may, at his leisure, prepare colored figures of such objects, long after the objects themselves have faded. Thus there is provided an international code of colors which may be used like a telegraphic code and by means of which men of different nations and professions may intercommunicate without risk of being misunderstood.

The scheme adopted in the code is a simplification of that used in the dye works at Gobelin and elaborated by the chemist Chevréul formerly in charge of the dye works. The simplification consists in reducing the number of pure colors from 72 to 24, in greatly reducing the number of tints and shades and broken colors, and in omitting the grays. The omission of the grays is justified on the ground that all grays are in nature impure, and are therefore represented in the "Code" by shades or broken colors. The Chevréul scheme contains 14,421 colors, including grays, while the "Code" contains but 720, excluding grays. The colors given in the "Code" are, however, so close together that only the trained expert will be able to discriminate intermediate colors; they are probably sufficient for all practical

purposes. They are between 4 and 5 times as many as in the Bradley papers, which have also been arranged in accordance with the scheme of Chevréul (Milton Bradley, *Elementary Color*).

M. Th. Valette, chemist of the government tapestry works at Gobelin, has selected the pigments used with special reference to their durability. The pigments have been applied to paper without the use of oil as a vehicle, so that their durability is thereby increased. The colored paper has been coated with an insoluble gelatin to protect it from the action of water. The paper thus prepared has been cut into samples 20 by 25 mm., and these have been pasted to the pages of the "Code." The book, thus prepared, seems to answer the needs of naturalists far better than any other practicable scheme, and its use should greatly lessen the growing confusion which has resulted from attempts to designate colors by names without any standard of reference. The writer has tested the book in the field with satisfactory results. While not all colors may be matched by it, the results are accurate enough for practical uses, and greater accuracy is at present to be had only by the use of the color wheel.

JACOB REIGHARD.

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